CLAIMS:

1. A cap assembly comprising:

a cap having a recess for sealing to a container and a vapor path opening for vapor passage between the container and an external atmosphere;

a venting media attached to the cap and oriented in said vapor path forming a barrier isolating the container from the external atmosphere;

a stopper seated in a first position within the cap adjacent the recess, said first position allowing passage of vapor between the container and the external atmosphere;

said stopper being movable to a second position in the container to close the container and prevent the passage of vapor.

2. The cap assembly of claim 1, wherein said cap is hermetically sealed to said container.

3. The cap assembly of claim 1, wherein said cap comprises a single material.

4. The cap assembly of claim 1, wherein said cap comprises at least two components.

5. The cap assembly of claim 4, wherein said cap assembly comprises a rigid section and a conformable section.

6. The cap assembly of claim 1, wherein said venting media comprises a hydrophobic material.

7. The cap assembly of claim 1, wherein said venting media comprises expanded PTFE.

8. A cap assembly for the isolation of contents in a container comprising:

a cap having (a) a recess adapted for sealing to a container and for maintaining a stopper over the container, and (b) a vapor path opening for vapor passage between the container and an external atmosphere; and

a venting media attached to the cap and oriented in said vapor path forming a barrier isolating the container from the external atmosphere,

said cap assembly being adapted for maintaining the stopper in a first position which allows passage of vapor between said container and the external atmosphere and moving said stopper to a second position to close the container and prevent the passage of vapor.

9. The cap assembly of claim 8, wherein said cap is hermetically sealed to said container.

10. The cap assembly of claim 8, wherein said cap comprises a single material.

11. The cap assembly of claim 8, wherein said cap comprises at least two components.

12. The cap assembly of claim 11, wherein said cap assembly comprises a rigid section and a conformable section.

13. The cap assembly of claim 8, wherein said venting media comprises a hydrophobic material.

14. The cap assembly of claim 8, wherein said venting media comprises expanded PTFE.

15. A cap assembly for the isolation of contents of at least one vial located in a container, comprising

a cap having (a) a recess for sealing to the container and for maintaining at least one stopper over the at least one vial located in the container, and (b) a vapor path opening for vapor passage between the at least one vial in the container and an external atmosphere;

a venting media attached to the cap and oriented in said vapor path forming a barrier isolating the container and the at least one vial located therein from the external atmosphere;

said cap assembly being adapted for maintaining the at least one stopper in a first position which allows passage of vapor between said at least one vial and the external atmosphere and moving said at least one stopper to a second position in the at least one vial to close the vapor path and prevent the passage of vapor.

16. The cap assembly of claim 15, wherein said cap is hermetically sealed to said container.

17. The cap assembly of claim 15, wherein said cap comprises a single material.

18. The cap assembly of claim 15, wherein said cap comprises at least two components.

19. The cap assembly of claim 18, wherein said cap assembly comprises a rigid section and a conformable section.

20. The cap assembly of claim 15, wherein said venting media comprises a hydrophobic material.

21. The cap assembly of claim 15, wherein said venting media comprises expanded PTFE.

22. A method for isolating and processing contents in a container comprising:

providing a cap assembly comprising (1) a cap having (a) a recess adapted for sealing to a container and for maintaining a stopper over the container, and (b) a vapor path opening for vapor passage between the container and an external atmosphere; and (2) a venting media attached to the cap and oriented in said vapor path forming a barrier for isolating the container from the external atmosphere, said cap assembly being adapted for maintaining the stopper in a first position which allows passage of vapor between said container and the external atmosphere and moving said stopper to a second position to close the container and prevent the passage of vapor;

sealing said cap assembly to the container having therein material to be processed with the stopper oriented in the first position to allow passage of vapor between said container and the external atmosphere;

processing the material in the container; and

moving said cap assembly and said stopper to a second position to close the container and prevent the passage of vapor.

23. The method of claim 22, wherein said attaching provides a hermetic seal between said cap assembly and said container.

24. The method of claim 22, wherein said processing comprises at least one method selected from the group consisting of evaporative drying, sublimation drying, cell culturing, fumigation, mixing under controlled atmosphere and reacting under controlled atmosphere.

25. The method of claim 22, wherein said processing comprises freeze-drying.

26. The method of claim 22, wherein said stopper is held within said cap assembly.